NEWS RELEASE

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Ring Cuts Costs for Satellites to Space

KIRTLAND AIR FORCE BASE, NM – It started with an idea. On March 8, 2007, the Air Force working with CSA Engineering of Mountain View, Calif., made this dream a reality, paving the way for low-cost access to space for small satellites with the launch of the first Evolved Expendable Launch Vehicle Secondary Payload Adapter (ESPA) Ring.

Under the Small Business Innovation Research (SBIR) program the ESPA ring was designed, developed and flight qualified for the Air Force Research Laboratory's (AFRL) Space Vehicles Directorate. This new technology makes it possible to put six small satellites along with the larger primary satellite into orbit from a single launch vehicle.

-MORE-

Ring Cuts Cost for Satellites to Space-2

Placing six satellites into orbit is a high point for the Phase II SBIR program. This team effort was made possible with funding from the Space and Missile Systems Center (SMC) for SBIR Phase I, the Space Vehicles Directorate's structures team who managed the ESPA development and built the test facility, SMC's Space Development and Test Wing who led the mission and performed the spacecraft integration for the DOD Space Test Program (STP).

"This has been a great success story for us," said Dr. Jeffry Welsh, program manager of AFRL's structures team. "The Lab has always strived to support SMC, and the ESPA program has been a model for how to build a cohesive team between multiple government agencies, contractors and DOD primes to produce a quality product that will go a long ways towards reducing the cost of access to space."

The hardware was a critical part of the STP-1 mission, which launched from Cape Canaveral under the direction of the Space Development and Test Wing, depositing the Orbital Express spacecraft as well as four secondary payloads, (STPSat-1, FalconSat-3, MidStar-1, and CFESat), into their precise orbits.

The ESPA ring is five feet in diameter, two feet tall, made of half-inch thick aluminum which fits between the rocket and fuel compartment and the largest satellite. It is designed to carry a 15,000 pound primary satellite and up to six 400-pound secondary satellites on a Delta IV or Atlas V vehicle. The launch of the Atlas V mission and the first Space Test Program mission on an EELV is a significant step towards reducing the cost of space access.

This technology provides the physical link between the new Air Force launch vehicles and secondary spacecraft with minimal impact to the primary payload. The ESPA ring duplicates the standard interface plane of the Evolved Expendable Launch Vehicle (EELV) upper stage and is designed to be very stiff in all directions to minimize the vibration to the primary payload. The primary payload may have a mass of up to 15,000 pounds and since the ESPA ring is only 24 inches high, only a small

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volume is taken away from the primary payload. Vibration and shock isolation systems have been designed for spacecraft on ESPA.

When the EELV was being developed, the ESPA ring was being designed and built through AFRL. The EELV builders, Lockheed Martin and Boeing launch vehicle operations (now combined as the United Launch Alliance or ULA), were subcontractors to CSA. Both advised CSA on the launch environments for the ESPA design and also provided guidance for the development of the ESPA qualification program and test facility.

To perform the ESPA qualification tests, CSA designed and built the test facility. This general-purpose static test facility is located in the Space Vehicles Directorate and has extended its capability to support several major tests for SMC's Space Development and Test Wing.

The ESPA technology has a tremendous impact on future spacecraft programs by increasing the number of secondary payload launch opportunities with reasonable cost and on a regular schedule. DOD, NASA, universities and industry share an interest in using small satellites to perform space experiments, demonstrate new technology and to develop operational systems. Despite the benefits of using small satellites, the primary obstacles are infrequent launch opportunities and high costs. With the ESPA ring, these obstacles will go away.

Under the Space Test Program's Standard Interface Vehicle program a contract was awarded to Ball Aerospace and AeroAstro to build up to six ESPA-class spacecraft. Implementing a "launch on schedule," approach to provide rideshare opportunities and reduce the risk for launch by using existing technologies and standard interfaces will cut costs for multiple spacecraft buys.

AFRL Space Vehicles Directorate's Demonstration and Science Experiment program has based its free-flyer spacecraft configuration on a four-port ESPA ring that will form the spacecraft's hub. This experiment will be placed in medium Earth orbit, followed by deployment of booms and solar arrays.

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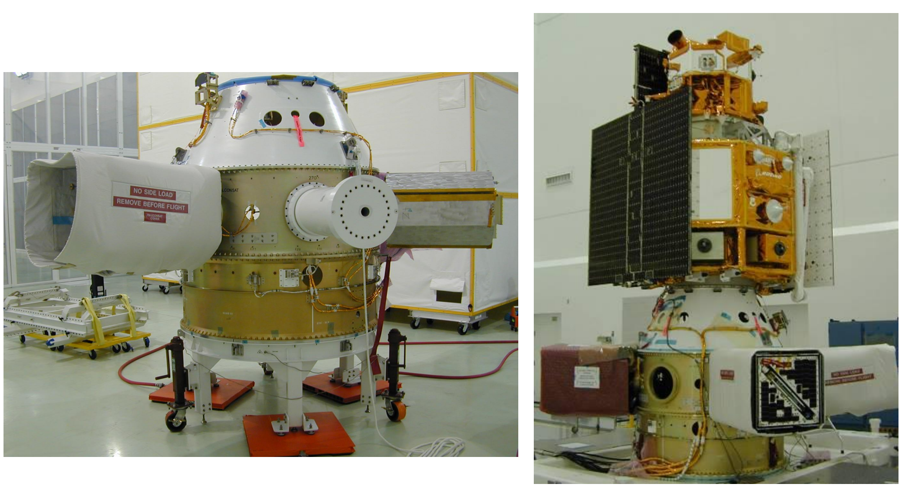
Ring Cuts Cost for Satellites to Space-4

The small satellite community has adopted the ESPA secondary payload interface as the standard ESPA spacecraft that mounts with a 15-inch-diameter bolt circle of 24 equally spaced fasteners. The ESPA secondary payload is defining the common small satellite configuration and interface requirements.

NASA has selected ESPA as the “de facto structure” to implement on secondary EELV missions, specifically for the Lunar Exploration Program. In April 2006, NASA announced the selection of the Lunar Crater Observation and Sensing Satellite as the secondary mission on the launch of the Lunar Reconnaissance Orbiter scheduled for October 2008, to look for water and ice at the lunar Polar Regions.

NASA moved the planned launch of the orbiter from a Delta II to an EELV (Delta IV or Atlas V). This change created an additional 1000 kilograms (approximately 2,200 pounds) of lift capacity for the orbiter’s lunar trajectory. NASA received proposals for secondary missions from NASA Center teams to support the search for water on the moon. CSA, who worked with may of the proposal teams to develop their co-manifest mission concepts, used the ESPA ring. Following the selection of the lunar exploration mission, CSA provided the ESPA ring for the mission’s Shepherding Spacecraft for Northrop Grumman Space Technologies and NASA/Ames. Today, many of the alternate secondary payload concepts formulated around the ESPA ring are continuing in development for future NASA exploration missions.



ESPA prior to integration and final flight until just prior to launch